The Evaluation and Management of Fever in Troops

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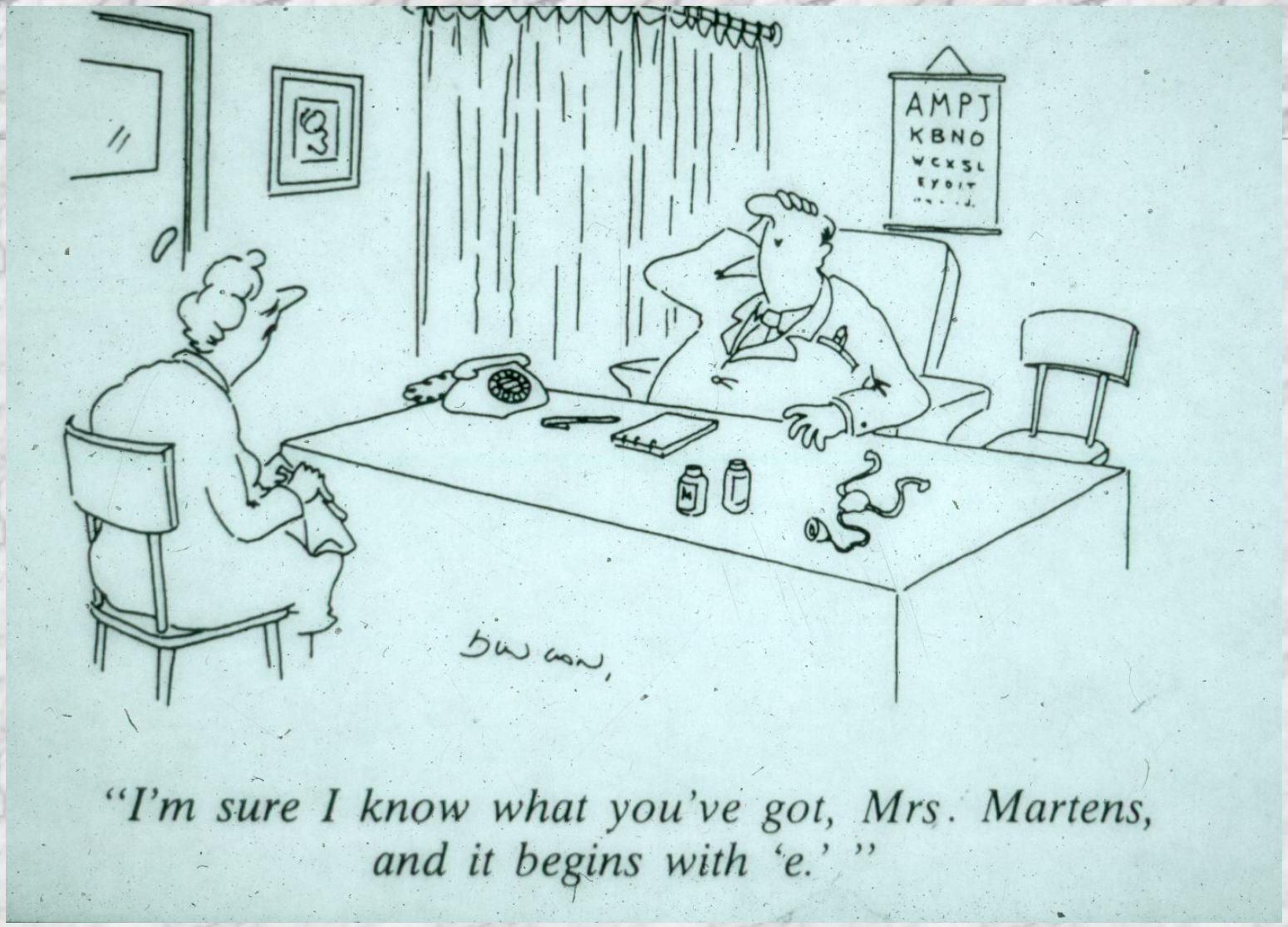
Definition

- Soldier/sailor/airman/Marine with temperature > 100.5, not with otherwise mundane process (sniffles; cystitis in women), and lasting longer than a day or two.
- Appearing either in CONUS, or during or post deployment to OCONUS



"I'm sure I know what you've got, Mrs. Martens, and it begins with 'e.' "

General Categories for Discussion

- Fever and rash
- Fever and headache
- Fever and diarrhea
- Fever and hypotension
- Fever and….fever (undifferentiated)
- Geographical peculiarities

Support in the Field (or, is this all I have??)

- Must assume minimal lab/radiology/-pharmacy support:
  - Laboratory: CBC, diff, urinalysis, Wright's stain (for malaria); lytes/amylase/liver functions; no serology (?Monospot or RPR); ± Gram stain and basic cultures (sputum, wound, urine, doubt blood). No BT diagnostics at clinic level.
  - Radiology: basic films; doubt USD, CT
  - Pharm: Routine IV and oral antibiotics

Fever and skin rash

- Infections
  - ***Viruses:*** **Dengue; HFRS. (Conjunctivae too). Rare Rift Valley, other HFs.**
  - ***Rickettsiae*****: Spotted fever group (scrub fever; tick typhuses)**
  - ***Spirochetes:*** **Lyme; leptospirosis; syphilis**
  - ***Bacteria:*** **Strep (scarlatina); Staph (TSS); meningococcus (purpura fulminans)**
  - ***Parasite:*** **?malaria---NO**

Fever and skin rash

- Non-infectious:
  - Drugs/medicines
- Approach to the patient: *PCN OR CEFTRIAXONE if suspect MENINGOCOCCUS*; pelvic examination: remove tampons; low threshold for TCN (doxy); low threshold for evaluation with close observation

Fever and headache

- *Viruses*--meningitis: enterovirus, influenza, HSV, dengue/HFRS
  --encephalitis: Japanese B, HSV
- *Rickettsial/spirochetal*--all
- *Bacterial:* meningitis pathogens
- *Fungal*--none
- *Parasitic*: malaria

Fever and headache

- Approach to the patient:
  - Low threshold for treatment if any suspicion of meningitis (ceftriaxone)
  - malaria smears (repeated--q12h); blood cultures if available; consider doxycycline

Fever and diarrhea

- Infectious Gastroenteritis
  - Viruses: Norovirus (Norwalk-like viruses)--most common
  - Bacteria: Enteroinvasive *E. coli; Shigella; Salmonella; Campylobacter, Vibrio parahemolyticus*
  - (?Typhoid--not usually)
  - Parasites: amebiasis

Fever and diarrhea (cont.)

- Systemic illnesses, Non-Gastroenteritis
  - MALARIA; Pyelonephritis; PID; Pneumonia; Rickettsial diseases
- Approach: Stool smear for fecal leucocytes; culture and O+P exam if possible; empiric therapy (with quinolone) if bad (Imodium usually OK!!); urinalysis; CXR if suspicious. Malaria smears q12h if in/from endemic area!!

Fever and Hypotension

- **Viruses:** Hemorrhagic fever and renal syndrome (HFRS) viruses; Dengue HF (rare in Westerners)
- **Bacteria:** Sepsis, any site of origin; Gram-pos cocci (Staph, Strep, pneumococcus) or Gram-negatives (meningococcus; enterobacteriaceae from GU or GI tract; *Salmonella typhi*
- **Parasite:** Malaria
- **Rickettsiae:** Typhus fever group
- **Fungi/spirochetes**: Not really (leptospirosis)

Fever and Hypotension Approach to Management

- **Treat first, culture later**
- **Adequate IVFs; Remove tampons**
- **Empiric antibiotic therapy:**
  - **Naf- or Oxacillin/Aminoglycoside vs. Naf- or Oxacillin /Ceftriaxone or cefotaxime**
  - **WITH OR WITHOUT: Tetracycline or doxycycline (if no clue, or if Rickettsiae or plague possible), or mefloquine (if malaria possible)**
  - **THEN: More thorough exam; drain foci; XRs/bloodwork; malaria smears; Culture everything**

Fever and…Fever (undifferentiated)

- Non-localizing R.O.S. and exam? May be too early for pathogen to manifest. Observe, if possible.
- Higher level of concern: abnormal CBC, urinalysis, or very high ESR or LFTs

Fever and…fever (cont.)

- Common eventual diagnoses:
  - **Malaria**
  - **Undifferentiated viruses, typhoid fever, drug fever**
- Approach:
  - **Basic labs, including Malaria smear (q12h) if appropriate region; consider blood cultures**
  - **Treat empirically only if toxic appearing (ceftriaxone ± doxy ± mefloquine)**

Geographic fevers
Caribbean; Central/South America

- **Caribbean**: Dengue; Hep A; Infectious Diarrheas; Malaria (*vivax* except Haiti)
- **Central America** (esp. Panama/Honduras): As above, but also histoplasmosis
- **South America**: as above, but also Yellow Fever in Amazon basin; mostly *vivax* still, but more falciparum, which is chloroquine resistant

Geographic fevers

Middle East; Afghanistan/Persian Gulf

- Infectious diarrheas; (hepatitis)
- Occasional tuberculosis, leishmaniasis
- Rare (Malaria, sandfly fever) to None (Yellow fever, Hemorrhagic fevers)
- No data for the presence of ANY novel Persian Gulf-Illness associated pathogen

Geographic fevers
Africa

- Mediterranean (Suprasaharan):
  - **Infectious Diarrheas; (Hepatitis); Rift Valley and Sandfly fever in East; NOT really malaria**
- Subsaharan:
  - **As above, although malaria so prevalent as to be expected. Mostly *falciparum*. Also Yellow fever; filarial, leishmanial, and trypanosomal fevers less common (blood/marrow smear diagnoses); lepto; schistosomiasis; TB will be later**

Geographic fevers
Indian Subcontinent/Far East

- Korea/Japan:
  - **(Hepatitis); STDs; HFRS (KHF); tuberculosis later; no malaria or JB encephalitis in Japan**
- Southeast Asia/India:
  - **Infectious diarrheas/(hepatitis)/typhoid fever; STDs; resistant falciparum malaria; plague; scrub typhus; filarial fevers; TB later.**
- **Note: No Yellow fever; hard to catch cholera**

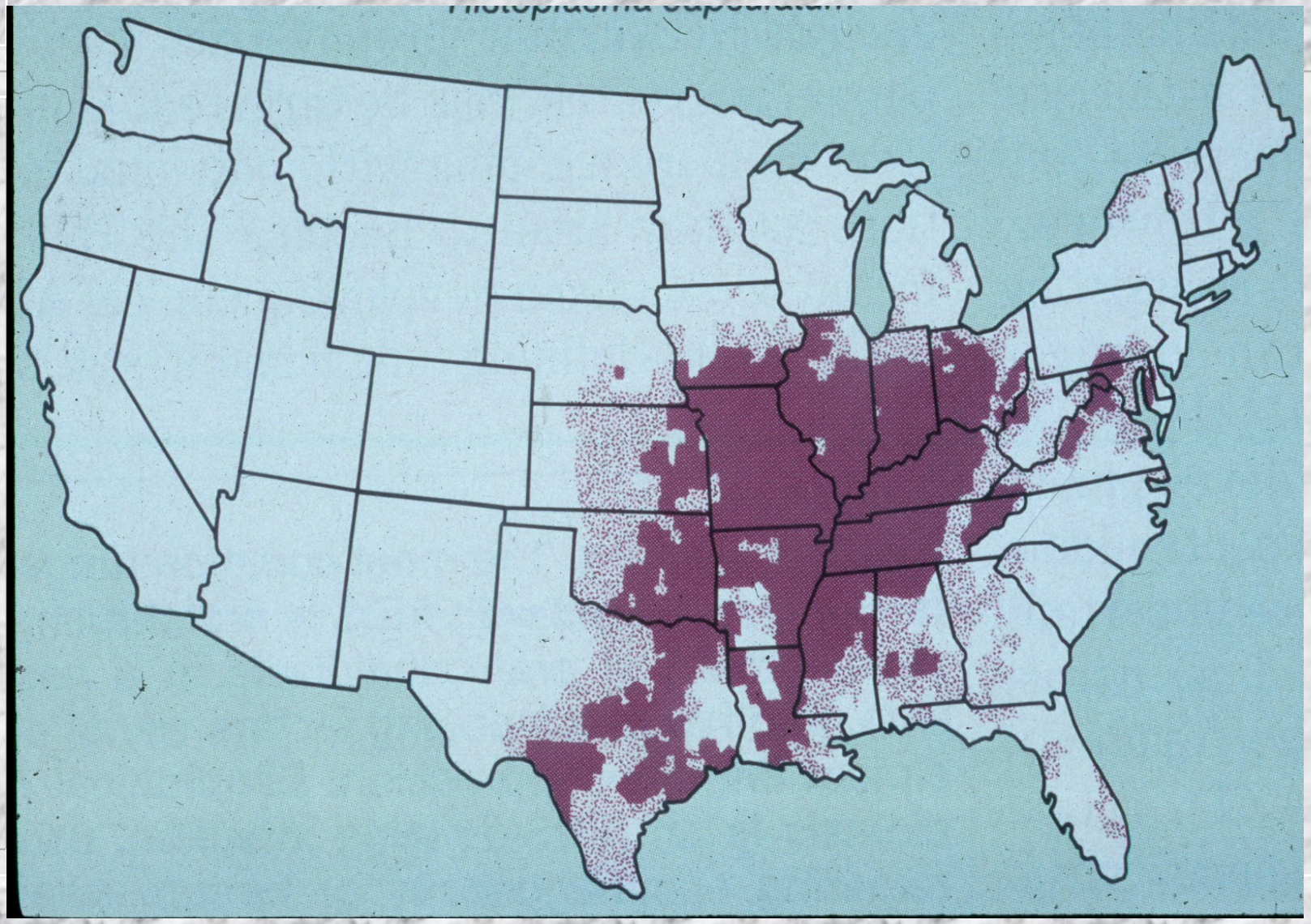
Geographic fevers
Europe

- **Northern Europe:**
  - **STDs, (hepatitis [A and B]), TB later**
- **Southern Europe:**
  - **As above, but also infectious diarrheas, resistant pneumococcus, occasional brucellosis and leishmaniasis**

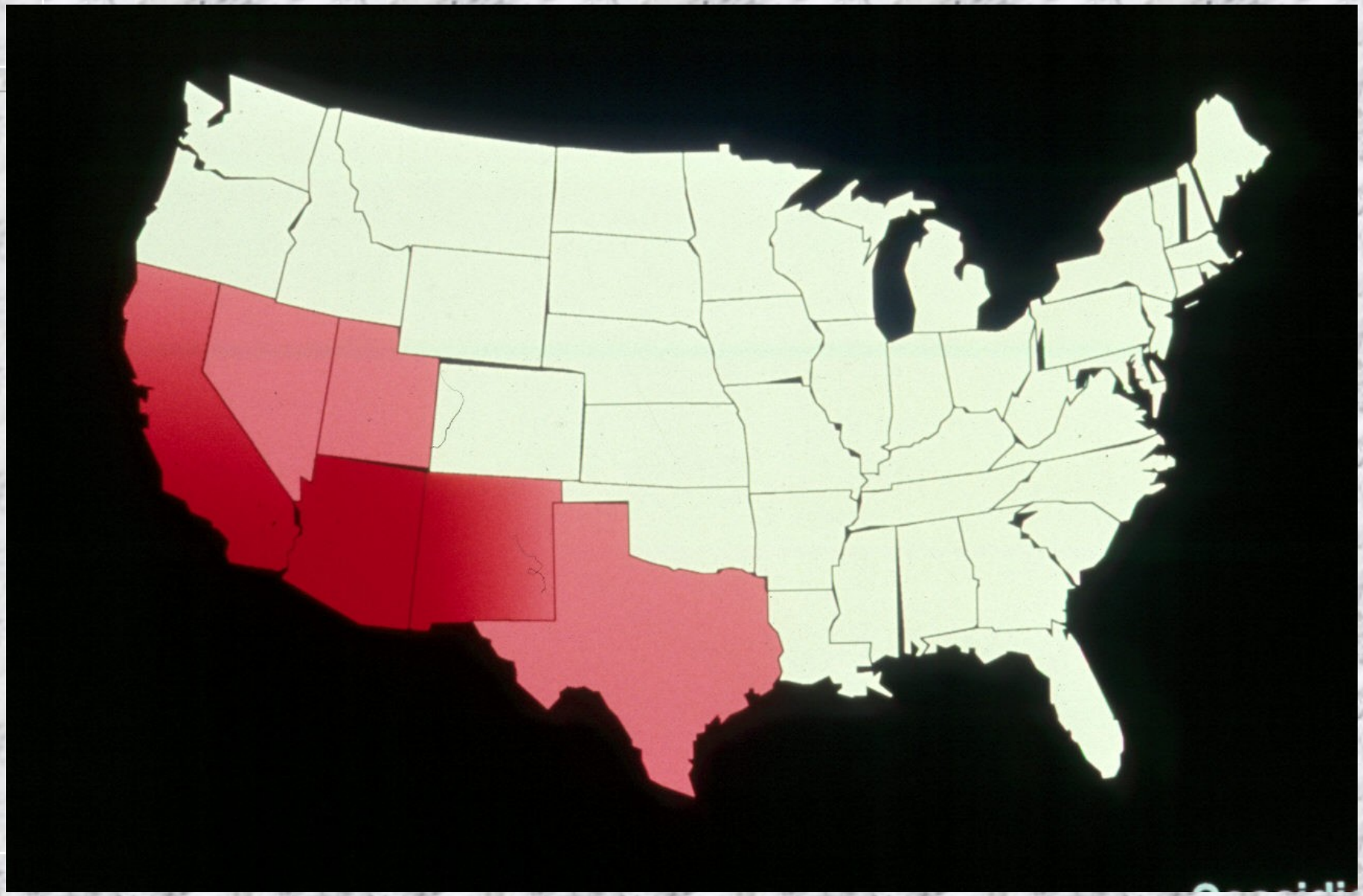
Geographic fevers Continental U.S.

- **Midwest:**
  - Histoplasmosis
- **Southwest:**
  - Coccidioidomycosis (Valley fever); Hantavirus pulmonary syndrome (not yet in troops); plague (not yet in troops).
- **Mid-Atlantic states; Arkansas and adjacent states:**
  - RMSF, Ehrlichiosis
- **Coastal areas:**
  - Invasive Vibrio disease

Histoplasmosis region



Coccidioidomycosis region



What can YOU catch? (Nosocomial exposures)

Meningococcal disease TB

Varicella Hepatitis A, B

- Staph, pneumococcal disease---not really
- Plague, Grp A Streptococcus---sorta
- Fungi, parasites, spirochetes---NO